Research in Brief

ADHERE: Evaluating variability in train driving under different adhesion conditions
T1159

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RESEARCH AND DEVELOPMENT

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Data-driven analysis of how driver strategies vary in different adhesion conditions

Background
It is widely understood that low adhesion experienced during autumn leaf-fall periods cause a marked increase in the range and variability of driving strategies. For example, how traction is taken to accelerate away from stations, what speeds are attained and the level of brake demand and duration applied when approaching stations.

Detailed analysis had not been undertaken to measure the extent of variability before this study. As such, this work provides new understanding into driving style in low adhesion.

Who this is for
This work provides train operations with indicative findings through deep-dive statistical analyses. It computes the variation away from the average (mean) for multiple aspects of driving strategy under different adhesion conditions assessing different metrics such as proportion of time in each brake step during arrival. The results are limited to one route and traction type over a single autumn, so caution needs to be applied in any attempt to generalise the results.

Indicative findings
This research analysed data for services on the 32-mile Cross-City line (Birmingham) from autumn 2018. It mapped OTDR data from Class 323 units with other operational data to the infrastructure. This was collated into a SQL database (available to members on request).

When comparing instances where low adhesion was experienced to instances where it was not, the analysis found:

• there was more variation in driving technique during low adhesion as expected; however there was more variation seen in how power was taken departing stations that other phases of driving
• consistent gentle braking using mostly step 1 in all adhesion conditions may account for less variation in braking technique during low adhesion.

Where to find out more and database access
The research report contains full details of the project, including the method, data analysis and the findings. This is available in the T1159 collection in RSSB’s repository on SPARK: (www.sparkrail.org). The database, along with a user guide developed by T1159 is also available, please use the RSSB customer self-service portal to find out how to access it.

This project has been a valuable first step in taking the large amount of data available and statistically analysing it to better understand when and where we see driving variability in autumn. This project provides the foundation for a suite of projects that are being undertaken on the Cross City line which will give us a much greater insight into what factors will have an influence on reducing driver variability in low adhesion across the whole network.

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